

REMARKS

In the October 3, 2005 Office Action, the Examiner objected to the drawing for the reason that Figures 1-2 are not designated by a legend such as "Prior Art." Accompanying this Amendment are proposed replacement sheets with corrected Figures 1-2 marked up to include the legend "(PRIOR ART)". Approval of the proposed drawing amendments to Figures 1-2 and withdrawal of the objection to the drawing are respectfully requested in view of the proposed drawing amendments.

In the Office Action mailed on October 3, 2005, the Examiner objects to original claims 14-17 and 22-24 as informal due to recitation of "The scanning force microscope" instead of "The scanning probe microscope." In accordance with the foregoing Amendment, "The scanning force microscope" in claims 14-17 and 22-24 is amended to read "The scanning probe microscope" as recommended by the Examiner for consistency.

Claims 1-26 are pending in the present application. The foregoing Amendment cancels claims 27-29.

In the October 3, 2005 Office Action, the Examiner rejects original claims 3, 5, 7, 20, and 25 under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which the applicants regard as the invention. On the one hand, referring to claims 3, 5, and 7, the Examiner contends that use of the term "quartz crystal cross

oscillator" is not clearly defined and its intended meaning is unclear. A quartz crystal cross oscillator 14 is disclosed at page 12, line 15 through page 13, line 12 of the originally filed specification and shown in Figure 3 of the present application. As shown in Figure 3, the quartz crystal cross oscillator 14 comprises a crystal base and an arm 12. In accordance with the foregoing Amendment, claim 3 is amended to recite the disclosed structure. Because claims 5 and 7 depend from amended claim 3, no amendment to either claim 5 or claim 7 is believed to be needed.

Also, referring to claims 20 and 25, the Examiner contends that use of the term "small" is a relative term which renders the claims indefinite. Claims 20 and 25 are amended by the foregoing Amendment to substitute what is intended by use of the term "small."

In the Office Action mailed on October 3, 2005, the Examiner rejects original claims 1-2, 4, 6, 9, 10, 12, and 13 as being unpatentable as anticipated by the disclosure in Tomita, U.S. Patent No. 6,201,227 B1 (the "Tomita Patent") under 35 U.S.C. § 102(b). Claim 1 is amended by the foregoing Amendment to further distinguish over the Tomita Patent and is therefore deemed allowable for the following reasons.

Claim 1 is amended in view of the disclosure at page 15, lines 1-5 of the originally filed specification to recite that

"an optical microscope disposed with the probe positioned between the optical microscope and the surface of the sample with the probe within a field of view of the optical microscope for viewing a location of the probe mounted to the sensor for helping to position the probe with respect to a region of the surface of the sample to be imaged." The optical microscope enables an operator to readily view the position of the probe as shown in Figure 2. The optical microscope is used for positioning the probe 10 with respect to a region of interest on the surface of the sample. This facilitates use of the scanning probe microscope.

On the other hand, Figure 5 of the Tomita Patent discloses an optical viewing system consisting of lenses 7 and 8, mirrors 22 and 23, a half-mirror 31, and a CCD camera 29. In contrast, amended claim 1 recites that the probe is positioned between the optical microscope and the surface of the sample so that the probe is in the field of view of the optical microscope, whereas the probe 1 is not in the field of view of the optical viewing system disclosed in the Tomita Patent. The configuration disclosed in the Tomita Patent does not enable the operator to readily position the probe 1 over a region of the surface of a sample 17 to be imaged.

The invention defined by amended claim 1 comprising an optical microscope positioned to view the position of the probe

with respect to a region of the surface of the sample facilitates positioning of the probe to image a region of interest on the surface of the sample. Consequently, the invention defined by amended claim 1 is allowable in view of the disclosure in the Tomita Patent. Additionally, claims 2, 4, 6, 9, 10, 12, and 13 depend either directly or indirectly from amended claim 1 and are therefore allowable for at least the reasons that amended claim 1 is allowable in view of the disclosure in the Tomita Patent.

In the October 3, 2005 Office Action, the Examiner further rejects pending claims 3, 5, and 7 as being unpatentable as obvious in view of the disclosure in the Tomita Patent combined with the disclosure in Terasawa, *et al.*, Japanese Patent No. 2000083976 A (the "Terasawa Patent") under 35 U.S.C. § 103. It is respectfully submitted that the amendment to claim 3, from which claims 5 and 7 depend, obviates the rejection under 35 U.S.C. § 103. Figure 6 of the Terasawa Patent discloses what appears to be a circular mechanical ring "cross oscillator" 25 that does not have an arm as recited in amended claim 3. Therefore, the Terasawa Patent does not cure the deficiency of the disclosure in the Tomita Patent which discloses only a quartz oscillator 4 and does not disclose a quartz crystal cross oscillator. Consequently, the invention defined by amended claim 3 is allowable in view of the disclosure in the Tomita Patent combined with the disclosure in the Terasawa patent.

Additionally, claims 5 and 7 depend directly from amended claim 3 and are therefore allowable for at least the reasons that amended claim 3 is allowable in view of the disclosure in the Tomita Patent combined with the disclosure in the Terasawa patent, whether the disclosures in the Tomita and Terasawa Patents are considered singly or in combination.

In the Office Action mailed on October 3, 2006, the Examiner additionally rejects pending claim 11 as being unpatentable as obvious in view of the disclosure in the Tomita Patent under 35 U.S.C. § 103. Pending claim 11 depends indirectly from amended claim 1. It is submitted that the rejection of claim 11 under 35 U.S.C. § 103 is obviated by the amendment to claim 1 discussed above that renders amended claim 1 allowable in view of the disclosure in the Tomita Patent. Therefore, claim 11 is allowable for at least the reasons that amended claim 1 is allowable in view of the disclosure in the Tomita Patent, as well as for the reason that the Tomita Patent does not disclose operation at a resonance frequency greater than 400 kHz as recited in claim 11.

In the October 3, 2005 Office Action, the Examiner further rejects pending claims 14-15, 18-22, 25, and 26 as being unpatentable as obvious in view of the disclosure in the Tomita Patent combined with the disclosure in Chen, *et al.*, U.S. Patent

No. 6,169,281 (the "Chen Patent") under 35 U.S.C. § 103. This rejection by the Examiner is traversed for the following reasons.

The Chen Patent discloses at column 15, in lines 31-43 that a scanning force microscope 240 is configured to apply, to a probe tip 130, vibration in the Z-direction at an excitation frequency derived from an excitation oscillator 36, vibration in the X-direction at an X-axis dithering frequency derived from an X-axis dithering oscillator 242, and vibration in the Y-direction at an excitation frequency derived from a Y-axis oscillator 191. Both the dithering vibration frequencies in the X- and Y-directions are significantly lower than the excitation vibration frequency in the Z-direction, and the dithering vibration frequencies in the X- and Y-directions are sufficiently separated from one another to allow the separate detection of their effects on actual vibration in the Z-direction. However, the Chen Patent only discloses that the difference between the dithering vibration frequencies in the X- and Y-directions is "sufficiently separated from one another to allow the separate detection of their effects on actual vibration in the Z-direction" and fails to disclose that there is a substantial difference between the dithering vibration frequencies in the X- and Y-directions. On the other hand, pending dependent claims 14 and 15 and independent claims 21 and 22 recite that there is a substantial difference in resonant frequency between first and second (e.g.,

X- and Y-) direction electromechanical transducers. The Chen Patent fails to disclose that it is critical that the resonant frequency of the actuator producing motion along the slower scanning axis be substantially less than the resonant frequency of the actuator producing motion along the faster scanning axis, as disclosed at page 24, lines 9-11 of the originally filed specification. Consequently, the invention defined by claims 14, 15, 21, and 22 is allowable in view of the disclosure in the Tomita Patent combined with the disclosure in the Chen patent. Additionally, claim 20, which depends from claim 14, and claims 25 and 26, which depend from claim 21, are allowable for at least the reasons that respective claims 20 and 21 are allowable in view of the disclosures in the Tomita and Chen Patents, whether the disclosures in those patents are considered singly or in combination.

Additionally, the disclosure in the Chen Patent to which the examiner refers does not disclose or suggest the structure recited in pending dependent claim 18 comprising two electromechanical transducers for moving the probe toward or away from the sample (e.g., two Z-direction electromechanical transducers). Consequently, the invention defined by claim 18, as well as claim 19 that depends from claim 18, is allowable in view of the disclosure in the Tomita Patent combined with the

disclosure in the Chen patent, whether the disclosures in those patents are considered singly or in combination.

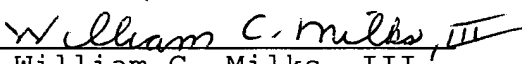
Also, in the Office Action mailed on October 3, 2006, the Examiner rejects pending claims 16 and 23 as being unpatentable as obvious in view of the disclosure in the Tomita Patent combined with the disclosure in the Chen Patent and the disclosure in Furukawa, et al., U.S. Patent No. 6,207,069 B1 (the "Furukawa Patent") under 35 U.S.C. § 103. Claim 16, which depends from claim 15, and claim 23, which depends from claim 21, are allowable for at least the reasons discussed above that respective claims 15 and 21 are allowable in view of the disclosures in the Tomita and Chen Patents whether the disclosures in those patents are considered singly or in combination, because the disclosure in the Furukawa Patent does not cure the deficiencies of the disclosures in the Tomita and Chen Patents.

Finally, in the October 3, 2005 Office Action, the Examiner rejected pending claims 17 and 24 as being unpatentable as obvious in view of the disclosure in the Tomita Patent combined with the disclosures in the Chen Patent and the Furukawa Patent and the disclosure in Normen, U.S. Patent No. 6,577,977 B2 (the "Normen Patent") under 35 U.S.C. § 103. Claim 17, which depends from claim 15, and claim 24, which depends from claim 21, are allowable for at least the reasons discussed above that

respective claims 15 and 21 are allowable in view of the disclosures in the Tomita and Chen Patents, whether the disclosures in those patents are considered singly or in combination, because the disclosures in the Furukawa and Normen Patents do not cure the deficiencies of the disclosures in the Tomita and Chen Patents.

In view of the foregoing Amendment, it is submitted that the application is in condition for allowance. Early action and allowance of the application are earnestly solicited.

Respectfully submitted,


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